



**National Center for  
Autonomous Technologies**



# THINK AUTONOMOUS

## APRIL 2021



# MESSAGE from the DIRECTOR JONATHAN BECK



The trend of exciting opportunities in challenging times has continued as we've navigated into the spring. The NCAT community has been persistent in building networks and connections across the country, driving technician education in all things Autonomous Technologies. The Federal Aviation Administration (FAA) Unmanned Aircraft Systems Collegiate Training Initiative (UAS-CTI) has reached more than 73 member organizations, across 36 states, primarily 2-year colleges. In April, at the FAA UAS-CTI meeting, NCAT presented on the CTI repository website, and the resources that serve the community, providing content, curriculum, workshops, presentations and many other resources.



NCAT has taken a deep dive into the depths of Virtual Reality to sustain social interaction, STEM engagement and increase access to activities including educator workshops and student competitions. From our October VR Workshop experience and subsequent VR activities, NCAT is helping to power the international 2021 MATE ROV Virtual Season, in which 7000+ students from all over the U.S. and more than 30 countries will participate. The teams planning and creativity to strategically use virtual collaborative environments is leading to increased access, reach, equity and inclusion, empowering educators and students with new educational opportunities in spite of the impact of a global pandemic.



The voice of our industry partners has been strong, supporting the work of the NSF Center for Occupational Research and Development (CORD). A special thanks to Justin Manley, Founder of Just Innovation and Todd Colten, Chief Aerospace Engineer at Sentera, providing their expertise and insights into the technician opportunities in agriculture, drones and the ocean economy featured in the Preparing Technicians for the Future of Work series! There are many exciting career opportunities in autonomous technologies that requires us to keep innovating and updating our programs to stay current and relevant.



Speaking of program development, congratulations to the MN TCOE on receiving an NSF ATE award for the "Innovative Semi-Autonomous Truck and Off-Highway Powered Equipment (IAS-TOPE)" project (DUE#2054997). The trucking and off-highway powered equipment industries are a major contributor to the U.S. economy. The integration of autonomous technologies will have a significant impact on the technician workforce supporting these critical industries. The ISA-TOPE project will provide the NCAT network with the educational resources for teachers, students and the current workforce to enhance knowledge and skills to operate, service, and maintain the vehicles of the future.

Looking forward to a beautiful spring, continued growth and hopefully the transition back to in-person events in the near future.

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## WHAT'S YOUR STORY?





## **New to the World of UAS, Professor of Chemistry Takes Passion in Leveling the Playing Field for Students**

Shawn Shields Lyons set out to integrate GIS into Chemistry courses at Germanna Community College.

**[READ HER STORY](#)**



*Lisa Bradshaw pictured with her team competing at Hawaii ROV Competition (bottom left).*

## Bradshaw Propelled Through to Earn Masters in Electrical Engineering - Now Active Safety Software Engineer at General Motors

MATE ROV Competition Alumni, Lisa Bradshaw broke down barriers in order to pursue her quest to work in the automotive industry.

[READ HER STORY](#)

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# NCAT ACTIVITIES





## NCAT Presenting at the 2021 STEM for All Video Showcase

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The [2021 NSF STEM for All Video Showcase: Learning from Research and Practice](#), will be held on May 11 - 18, 2021. This year's themes are: STEM for All: COVID, Equity & Social Justice featuring topics on:

- ✓ Projects or partnerships addressing broadening participation
- ✓ Impacts of COVID on STEM teaching and learning
- ✓ Design and implementation of STEM and CS programs
- ✓ Research informing STEM and CS teaching and learning
- ✓ Measuring impact of innovative programs

**NCAT will be participating in the 2021 STEM for All Video Showcase** highlighting the innovative steps we've taken to design and implement Virtual Reality into STEM activities and virtual learning. We've all heard or probably experienced "zoom fatigue" and NCAT is taking a creative approach at giving students and educators a more engaging experience that allows them to interact and socialize as if they are attending in-person.



STEM

## VR: SUSTAINING SOCIAL INTERACTION, STEM ENGAGEMENT & ACCESS

Be sure to check out the showcase & vote for the video that is most effective in conveying the creative work being done!

[LEARN MORE](#)

## SURVEY



## Negative Reactions to Drone Operations



NCAT is partnering with the GeoTech Center to document and map incidents where the public has had a negative reaction to drone operations. Data will be collected and used to produce a map in order to visualize these incidents. Data points (without personal identifying information) will be shared with the drone community and the Federal Aviation Administration (FAA).

### **Have You Witnessed a Hostile Act Against Drones or Their Operators?**

*If so, please take time to assist NCAT, GeoTech and the FAA with this research by completing this short survey. Your responses will help quantify the prevalence of these negative reactions and geolocate the incidents, in order to focus greater outreach and education in these regions.*

**TAKE SURVEY**

## **NEW RESOURCES**



### **Starting a Drone Program?**

*Let us help.*

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NCAT provides the resources necessary to guide you through the process of starting a drone program at your school. View our vast resource library that covers drone laws and regulations, curriculum for both secondary and post-secondary programs, drone operations and best practices, grant funding resources, student competitions and more!

**[VIEW RESOURCES](#)**

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## **Social VR Professional Development Workshops White Paper**

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The emergence and inescapability of Social Virtual Reality is changing STEM education, STEM fields and the STEM related technician workforce.

In 2020, NCAT became a leader in the use of Social Virtual Reality by quickly responding to pandemic imposed closures by offering educators some of the earliest opportunities to learn how to teach in Social VR.



NCAT has put together a guide to developing and implementing effective and engaging social VR events by using the example of the professional development workshop conducted entirely in Social VR. This guide shows the process of developing and implementing effective and engaging Social VR events that support learning, participation, and fill the void of interpersonal connections that have long been the downside of distance learning in any form.

[LEARN MORE](#)



## Virtual Space Onboarding

*NCAT has developed virtual space onboarding guides for those who are looking to use AltspaceVR through either the Oculus Quest VR headset or 2D Desktop version.*

Upon loading the Virtual Space Onboarding page, you will choose your path - VR Headset or 2D Desktop. Based on your choice, we will guide you through all of the necessary steps to take including everything from how to setup and pair your Oculus Quest device to attending events in AltspaceVR virtually or through 2D. You can either follow these steps online or download a PDF document guide to assist you through the process.

[\*\*CHECK IT OUT\*\*](#)

## Podcast Resources

**Looking for a podcast centered around autonomous technology?**

*NCAT leaders have compiled a list of their go-to podcasts across all domains - air, land, & sea.*

[\*\*CHECK IT OUT\*\*](#)

## UPCOMING EVENTS



**Register Now!**FAA Aviation Safety STEM Career Symposium  
[avsstemcareersymposium.vfairs.com](https://avsstemcareersymposium.vfairs.com)

## 3rd Annual FAA Aviation Safety STEM Career Symposium

**April 29, 2021 | 10:00 AM - 4:00 PM EST | Virtual Event**

The FAA Aviation Safety (AVS) STEM Career Symposium is designed to educate students about STEM/aviation-related career opportunities and encourage them to enter into these types of fields when considering their own career in the future.

The AVS STEM Career Symposium will include multiple guest speakers, interactive visual presentations, STEM engagement activities and opportunities for students to talk with Aviation Safety professionals. Participating students will learn about exciting AVS careers such as aviation safety inspectors, aerospace engineers, medical officers, pilots, and mathematicians.

**REGISTER**



## Service Learning Webinar

**April 29, 2021 | 12:00 PM - 1:30 PM CT | Virtual Event**

This webinar is a panel presentation for secondary and post-secondary educators, in transportation or related CTE programs, interested in creating or enhancing service learning in their education program. You will hear from a variety of presenters about their service learning projects, key successes, lessons learned, and the impact these projects have had. There will also be an opportunity for Q&A at the end of the presentation to ask any questions you may have.

By attending this webinar, you have the opportunity for individual consulting on your new or existing service learning projects with the Minnesota State Transportation Center of Excellence. Sign-ups for consulting will be made available after the webinar.

**REGISTER**



**EDUCATOR WORKSHOP**

**DRONETECH**  
UNMANNED AIRCRAFT SYSTEMS

PRESENTED BY:

**SkillsUSA**

**N**  
**NORTHLAND**  
COMMUNITY & TECHNICAL COLLEGE

**NCAT**

**INTRODUCTION TO SkillsUSA DRONE COMPETITION**

Introduction to the newly formed Skills USA Drone Competition. Topics covered include overview of program, competition manual, skills assessment areas and equipment options.

**MAY 18, 2021 | 10:00 AM - 12:00 PM CT**

## Introduction to SkillsUSA Drone Competition

**May 18, 2021 | 10:00 AM - 12:00 PM CT | Zoom**

Join us for an informational webinar to introduce the newly formed SkillsUSA sUAS Drone Competition! SkillsUSA Minnesota Executive Director - Jessa Dahmes will give an overview of the program and what they offer for schools and organizations. We will go through the competition manual and discuss skills assessment areas and equipment options as well as professional development opportunities for the core areas of the competition.

***This webinar is open to any parent, teacher, or organizational member interested in STEM outreach activities or enriching existing programs with a student competitions model.***

**REGISTER**





**EDUCATOR WORKSHOP**

**DRONETECH**  
UNMANNED AIRCRAFT SYSTEMS

PRESENTED BY:

**N**  
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**NCAT**

**INTRODUCTION TO  
IMAGERY &  
GEOSPATIAL ANALYSIS**

Instruction will cover processing of aerial (drone) imagery, creating mosaics, importing images into Geographic Information Systems (GIS), creating layers and analyzing imagery.

**MAY 20, 2021 | 10:00 AM - 3:00 PM CT**

## Introduction to Imagery and Geospatial Analysis

**May 20, 2021 | 10:00 AM - 3:00 PM CT | Zoom**

Join us for an introduction to Imagery and Geospatial Processing and Analysis. Instruction in this webinar will cover processing of aerial (drone) imagery, creating mosaics, importing images into Geographic Information Systems (GIS), creating layers, and analyzing imagery.

*This webinar is open to any parent, teacher, or organizational member interested in STEM outreach activities or enriching existing programs with a student competitions model.*

**REGISTER**

# EVENTS

Check out upcoming events including STEM camps and competitions, educator workshops, professional development opportunities, conferences and more!

[VIEW ALL EVENTS](#)

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## Do You Have an Event to Share?



We will promote your professional development workshops, webinars, educator workshops, or any other events related to autonomous technology and advanced technological education with our large network of educators, students, and industry leaders via our website and social media!

[SUBMIT EVENT](#)

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# INDUSTRY NEWS



April 19, 2021

## More Powerful Batteries Will Be "Game-Changer" for Aerospace

Todd Colten, chief Aerospace engineer and director of Flight Services at Sentera, envisions a "big revolution" in the aerospace industry as a result of advances in battery manufacturing infrastructure. Sentera is a global technology company that devises hardware and software to interface with precision agriculture equipment such as planters and...

[READ MORE](#)





April 9, 2021

## **NSF Grant Awarded to NCAT Partner - Minnesota State Transportation Center of Excellence**

Press Release 4/9/2021 Advanced technologies, technician shortages, lack of teaching resources, and expensive/complicated pieces of equipment. What do they all have in common? A big challenge for both education and industry. What's the solution. A collaborative approach. The Minnesota State Transportation Center of Excellence (TCOE), industry partners, and technical college...

[READ MORE](#)



April 8, 2021

## Ag Tech Company Leader Shares Insights about Trends for 3 Types of Technicians

Sentera, a global technology company that devises hardware and software to interface with precision agriculture equipment such as planters and fertilizer applicators, employs three types of technicians: engineering technicians who work in the Minnesota company's lab to build prototypes of unmanned aircraft systems (UAS), sensors, and cameras; geospatial information systems...

[READ MORE](#)



April 8, 2021

## Technician Opportunities Abound in Ocean Economy

Justin E. Manley, a marine technology innovator for three decades, sees many interesting, well-compensated opportunities in the ocean based or “blue” economy for people interested in hands-on, intellectual work. “There’s lots of roles that are a good fit,” he said. Among the challenges for technical educators is the historically low...

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March 24, 2021

## Girl Scouts Drone Programming Challenge Hosted by CAAT

The Center for Advanced Automotive Technology (CAAT) was pleased to work with the Girl Scouts of Southern Michigan and Women Who Drone organizations to provide 35 local Girl Scouts with an exciting opportunity to learn how to program and fly a drone. Girl Scout Cadettes explored the world of microcontrollers...

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This material is based in part upon work supported by the National Science Foundation (DUE 1902574). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

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